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Research Article

TREND OF INCIDENCE OF GASTRIC CANCER IN SISTAN AND BALUCHESTAN PROVINCE, IRAN

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ABSTRACT

Objective: Gastric cancer is the fifth most common cancer and the third cause of death from cancers in the world and is known as the most deadly cancer in Iran. Since the knowledge about the epidemiological situation and the trend of incidence of this cancer is essential to plan for the prevention and treatment of cancer, this study was performed with the aim of investigating the epidemiological status, the rate and the trend of gastric cancer incidence in Sistan and Baluchestan province.

Methods: This study was conducted using existing data and data extracted from the National Cancer Registry System and the Disease Management Center of Iranian Ministry of Health between 2003 and 2008. Age-Standardized incidence rates (ASIR) were calculated using the world standard population. The crude incidence rate was also computed. Cochran–Armitage test for linear trend was used for evaluation of the incidence trend.

Results: The number of 255 cases of gastric cancer occurred in the study period that 188 cases were in men and 67 in women. Accordingly, the incidence of gastric cancer has had an ascending trend in Sistan and Baluchestan (p=0.00) and its incidence in men and women has changed to 1.18 and 2.73 in 2004 to 1.84 and 4.48 in 2008, respectively. Furthermore, with ageing, the incidence of gastric cancer has increased in both sexes and its incidence was higher in men than women.

Conclusion: The incidence of gastric cancer has an increasing trend in Sistan and Baluchestan, hence, etiological surveys and programs of early diagnosis are useful in this province to the reduce cancer.

Keywords: Incidence, Gastric cancer, Iran, Epidemiology.

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INTRODUCTION

Cancers are among the most important non-communicable diseases that impose a major disease burden to the society [1-3]. The relative control of communicable diseases, increased life expectancy, changes of lifestyles, increase of environmental risk factors, genetic predisposition, and population aging is among the increasing factors of this disease in recent and coming decades [4-6]. One of the most common cancers is gastric cancer which is the fifth most common cancer and the third leading cause of death from cancers in the world. According to the global estimation, one million new cases of gastric cancer are diagnosed each year and nearly 723,000 people lose their lives by this disease. This is while more than 70% of cases occur in developing countries and half of the world cases happen in Southeast Asia [7,8].

Gastric cancer with 11.4% of the incidence cancer cases in Iran is counted as the second most common cancer in 2012 which is known as first cancer among men and third cancer in women. Furthermore, the incidence rate of gastric cancer is 2.2 times more in men than women. It is noticeable that gastric cancer with 15.5% of mortality due to cancer has been the most lethal cancer in 2012 [9].

Some of the environmental factors such as smoking, alcohol, *Helicobacter pylori* infection, and obesity have been known as the risk factors of gastric cancer [10,11]. However, these factors cannot explain the high incidence of this disease in the country lonely [12], but paying attention to genetic and hereditary risk factors should be considered as probable risk factors in causing the disease. Some studies have reported the increasing diameter of 1.5-3.5 times of gastric cancer in people with a family history of cancer [13]. Although the incidence cases of this disease are reducing due to appropriate intervention like health education and nutrition fields and control of predisposing behaviors, it is rising in developing countries due to aging, bad diet culture, and lack of control of inappropriate behaviors (such as smoking and alcohol) [14].

The prognosis of this disease is poor and its 5-year survival is 10-40% in most countries [15,16]. So that the survival has been 10-20% in European countries [17] and in Iran, according to performed studies, it has been different from 11-30% [18,19].

If the gastric cancer is diagnosed at early stages and appropriate treatment is done, we can prevent the disease progression and its distant metastasis and improve the prognosis [20].

Despite the fact that there are different treatment ways for this cancer, high lethality of gastric cancer and low survival rate of this cancer is significant. Since knowledge about the epidemiological situation and the trend of incidence of this cancer is essential to plan for the prevention and treatment of cancer, this study was performed with the aim of investigating the epidemiological status, the rate and the trend of gastric cancer incidence in Sistan and Baluchestan province.

METHODS

This secondary data analysis study was performed based on the longitudinal program the province of Esfahan in Iran that have the national registry of cancer (NCR) which is trying to identify all cases of cancer occurring in Iran. Data used in this study were obtained from NCR, and disease control and prevention of ministry of health and medical education in Iran for 2005-2008 [21]. More details about cancer registry in Iran were previously published [22,23]. In this study, data on the incidence of skin cancer were selected according to the International Classification of Diseases-Oncology (ICD10) with the code C44 for age groups and sex [24]. Age-standardized incidence rate (ASIR) was calculated using the world standard population. The

crude incidence rate was also computed. To describe incidence time trends for 4 years studied. Cochran–Armitage test for linear trend was used for evaluation of the incidence trend.

RESULTS

The statistics of Central Cancer Registry during the years of 2004 to 2008 shows that the number of recorded gastric cancer cases has been 255 in Sistan and Baluchestan province, which 188 cases have been recorded in men and 67 cases in women. With regard to gender distribution, 73.7% of cases were in men and 26.3% of cases in women. Therefore, the sex ratio of male to female was 2.8. The most incidence cases were in 2008 with 69 cases, and the lowest incidence rate with 32 cases has been recorded in 2004. We can point out to differences in standardized incidence in different age groups as other findings of this study, as with aging the incidence of gastric cancer increases both in men and women and age groups over 60 years have the highest standardized incidence rates in both sexes. Also during the study years, men in age group of 80-84 years, allocated the highest standardized incidence rate to themselves in 2007 (60.8 per hundred thousand (Table 1).

The statistics of cancer registry center in 2004-2008 shows that despite the decrease of ASIR of gastric cancer among the years 2005-2006 in men and its decrease among the years 2006-2007 in women, the total incidence changes trend has been ascending in Sistan Baluchestan in this time period (p=0.00). Increased incidence rate was seen in both sexes so that age-standardized incidence of gastric cancer in 2004 in women and men was 1.18 and 2.73 in one hundred thousand people, respectively that this rate changed to be 1.84 and 4.48 in 2008 in one hundred thousand people (Fig. 1).

DISCUSSION

The results of this study showed that the incidence of gastric cancer was high in Sistan-Baluchistan province and has had an increasing trend. According to Iranian cancer state registries report in 2009, gastric cancer has been one of the top ten cancers in Sistan-Baluchistan province. As it is accounted, as the most common cancer in men and the eighth most common cancer in women of the province [25]. Studies in different parts of Iran also show a high incidence rate of gastric cancer in the most province [26-31]. Since the vast majority of patients who are suffered from gastric cancer have a history of infection with *H. pylori* [32], and in Iran, more than 80% of the population over 40 years have a history of infection with *H. pylori*; this high incidence is reasonable [33]. Furthermore, in some parts of Iran, appropriate use of a refrigerator is not common as well; and still some incorrect food preserving methods exist among people that this phenomenon may explain another part of the increased incidence of gastric cancer in recent years [34]. Increase of the cancer record and its diagnosis can be among other causes of cancer incidence. The incidence of gastric cancer has been rising in this province. Despite the significant decline in the incidence of gastric cancer in the world, especially European countries such as Spain and Italy, which is as the result of the substantial improvement of living conditions, it is passing an ascending trend in developing countries like Iran. Some of this incidence increase is related to improved cancer registry system [35] in the country, and perhaps some proportion of that is due to changes in risk factors of this cancer such as an increase in *H. pylori* infection [36-41]. Surveying the distribution of sex frequency of these patients in the study period shows that the incidence of this cancer is always higher in men. In epidemiological study of gastric cancer in Ardabil during 2006 to 2012, the men include the most sufferers [42]. These findings confirm the findings of the review study of Crowe *et al*. which reports the ratio of male to female suffering at the global level as 2-1 [17]. So similar to most of the studies, in this study, the frequency of men sufferers has been twice more than women [43,44]. The more prevalence of the disease in men may be due to high-risk occupations such as farming

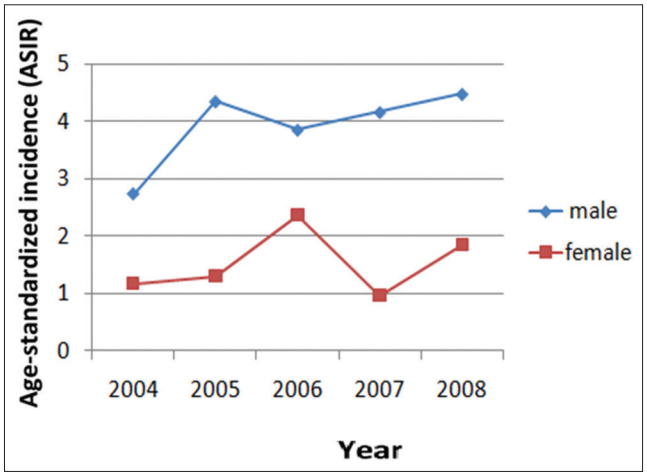

Fig. 1: Age-standardized incidence rates trend of gastric cancers in Sistan and Baluchestan by sex between 2004 and 2008

Table 1: ASIR of gastric cancers by sex in Sistan and Baluchestan during 2004 to 2007

Year	2004		2005		2006		2007	
Age-group	Female	Male	Female	Male	Female	Male	Female	Male
0-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58
15-19	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.00
20-24	0.00	0.00	0.82	0.00	0.00	0.00	0.00	0.87
25-29	0.00	1.06	1.08	0.97	1.08	0. 97	0.00	0.00
30-34	1.30	0.00	0.00	1.19	0.00	0.00	0.00	0.00
35-39	1.53	1.48	1.41	4.08	2.82	0.00	0.00	0.00
40-44	1.69	0.00	0.00	3.17	3.11	12.69	0.00	4.76
45-49	6.88	2.00	2.11	0.00	6.33	3.68	4.22	3.68
50-54	7.73	3.39	2.37	6.24	4.74	9.36	2.37	15.60
55-59	0.00	18.42	0.00	20.33	3.56	6.78	3.56	13.55
60-64	0.00	22.61	4.44	23.76	13.33	14.85	0.00	8.91
65-69	0.00	11.19	14.77	10.29	0.00	17.15	4.92	20.58
70-74	0.00	10.83	5.66	34.87	11.32	29.89	5.66	39.85
75-79	10.46	7.47	9.62	20.63	19.25	13.75	19.25	13.75
80-84	0.00	0.00	0.00	40.54	0.00	40.54	0.00	60.80
+85	0.00	0.00	0.00	54.38	29.52	0.00	0.00	0.00

ASIR: Age standardized incidence rates

and livestock due to contact with nitrate chemical fertilizers and nitrate contaminated soil and also high-risk behaviors in men such as smoking and genetic predisposition in one hand and the higher sensitivity of individual health care in women than men on the other hand [40,45,46].

Another finding of this study is that with aging in men and women, the incidence rate of gastric cancer increases and more than 60 years old age groups have the highest standardized incidence rate in both sexes and part of these patients are also the people under 45. The incidence of gastric cancer in people under 45 years old is mostly related to genetic risk factors [47-49]. Other studies also show that the incidence of cancers including gastric cancer increases with aging [28], as the study of Keyhanian *et al.* showed that the most common involved group in Ramsar is the age group of 60 to 90 years old [50]. The most important risk factor for the disease is infection with *H. pylori* [51] So that the vast majority of patients who are suffered from gastric cancer have had a history of this infection [32]. However, the existence and interaction of multiple genetic and environmental factors are necessary for gastric cancer. High consumption of red meat, spicy drink and hot tea, low consumption of fresh vegetables and fruits, high nitrate in water and people's food, gastric surgery, alcohol drinks consumption, tobacco use particularly smoking and low socioeconomic conditions, are from the most important risk factors of this disease which have had a role in its increased incidence in developing countries and Iran [51-55].

H. pylori eradication with the use of multi-drug regimens are from the primary prevention methods of gastric cancer, but there are still doubts about the general plan for the eradication and screening of *H. pylori* according to the results of different studies, and various studies are being done about it [51]. Among secondary prevention solutions, we can also point to identifying individuals susceptible to cancer in the early stages of disease, which is from the under investigation methods [51,56].

CONCLUSION

The incidence of gastric cancer has an increasing trend in Sistan and Baluchestan, hence, etiological surveys and programs of early diagnosis are useful in this province to the reduce cancer.

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